

**CLAIMS**

I claim:

1. A sensor assembly for measuring seatbelt forces comprising:  
a rigid member having a first end for supporting a seat belt portion and a second end for attachment to a vehicle structure;  
a strain gage mounted on said rigid member between said first and second ends for measuring the strain exerted on said rigid member by a tension force applied to the seat belt portion; and  
an electrical connector mounted to said rigid member adjacent to said strain gage for receiving strain measurements from said strain gage and transmitting said measurements to a central processor to determine the magnitude of the tension force.
2. An assembly according to claim 1 wherein said rigid member is a metallic plate defined by a length, width, and thickness with said length being greater than said width and said thickness being significantly less than said length and said width.
3. An assembly according to claim 1 wherein said rigid member includes a neck portion positioned between said first and second ends having a width that is less than the width of said first and second ends and wherein said strain gage is mounted on said neck portion.

4. An assembly according to claim 3 wherein said first end includes an elongated slot for a loop attachment to the seat belt portion and said second end includes at least one aperture for receiving a fastener for attachment to the vehicle structure.

5. An assembly according to claim 4 wherein said electrical connector is mounted to said rigid member adjacent to said second end between said aperture and said neck portion.

6. A sensor system for controlling airbag deployment comprising:
  - a seat belt for securing an occupant to a vehicle seat;
  - a rigid plate having a first end for supporting a portion of said seat belt and a second end for attachment to a vehicle structure;
  - a strain gage mounted on said rigid plate between said first and second ends for measuring the strain exerted on said rigid plate by a tension force applied to said seat belt;
  - an electrical connector mounted to said rigid plate adjacent to said strain gage for receiving strain measurements from said strain gage and transmitting said measurements to a processor to determine the magnitude of the tension force wherein said processor generates a force signal representative of the magnitude of said forces; and
  - an airbag mounted adjacent to the vehicle seat wherein airbag deployment is controlled based on said force signal.
7. A system according to claim 6 wherein said airbag does not deploy when said force signal exceeds a predetermined limit.
8. A system according to claim 7 wherein said rigid plate includes a neck portion positioned between said first and second ends having a width that is less than the width of said first and second ends and wherein said strain gage is mounted on said neck portion.
9. A system according to claim 8 wherein said vehicle structure is a B-pillar extending vertically adjacent to one side of said seat.

10. A system according to claim 9 including a secondary plate having a first end pivotally mounted to said B-pillar and a second end rigidly attached to said second end of said rigid member.

11. A system according to claim 10 wherein said first end of said rigid plate includes an elongated slot for a loop attachment to said portion of said seat belt and said second end of said rigid plate includes at least one aperture aligned with a corresponding aperture in second end of said secondary plate for receiving a fastener for attachment to attach said rigid plate to said secondary plate.

12. A system according to claim 11 wherein said first end of said secondary plate includes a circular boss for receiving a pivot pin.

13. A system according to claim 8 wherein said vehicle structure is a seat mount for a seat belt buckle latch mechanism.

14. A system according to claim 13 wherein said seat belt includes a buckle strap for supporting a male buckle member and said seat belt buckle latch mechanism includes a female receptacle for receiving said male buckle member to securely latch the occupant to said seat with said portion of said seat belt extending between said male receptacle and said rigid plate.

15. A method for controlling airbag deployment comprising the steps of  
providing a seat belt assembly having a buckle strap attached to a male buckle member, a seat belt latch mechanism having a female receptacle for receiving the male buckle member to secure an occupant to a vehicle seat, and a rigid plate having one end secured to a portion of the seat belt and an opposite end secured to a vehicle structure with a strain gage mounted to the rigid plate between the ends;

latching the male buckle member to the female receptacle

generating a tension force on the seat belt assembly by tightening the buckle strap;

measuring the strain on the rigid plate due to the tension force with the strain gage;

generating a tension force signal based on strain measurement; and

controlling deployment of an airbag based on the tension force signal.

16. A method according to claim 17 including the step of preventing deployment of the airbag if the tension force signal exceeds a predetermined limit.

17. A method according to claim 16 including the step of mounting the rigid plate to a B-pillar.

18. A method according to claim 16 including the step of mounting the rigid plate to a seat mount.

19. A method according to claim 16 including the step of mounting an electrical connector on the rigid plate adjacent to the strain gage to receive the strain measurement and transmit the measurement to a processor.